

CLAIMS

What is claimed is:

1. A gas turbine engine comprising:
 - a fan;
 - a compressor along a core flow path and having:
 - a plurality of rows of blades;
 - a plurality of rows of vanes; and
 - a plurality of shroud rings, at least a bleed one of which defines a plurality of bleed ports;
 - a structural hub downstream of the shroud rings and secured relative to the shroud rings;
 - a structural case extending from an aft joint with the structural hub to a fore joint with a joined one of the shroud rings and having a plurality of valve ports, at least a portion of the structural case extending structurally between the fore and aft joints
 - a valve element shiftable between:
 - a first condition in which the valve element blocks communication through the valve ports; and
 - a second condition in which the valve element does not block said communication.
2. The engine of claim 1 wherein:
 - the joined one of the shroud rings is not the bleed one of the shroud rings.
3. The engine of claim 1 wherein the at least a bleed one of the shroud rings comprises:
 - a shroud ring of an exit guide vane assembly having a plurality of duct portions associated with aft portions of said plurality of bleed ports; and
 - a bleed duct having a plurality of duct portions associated with fore portions of said plurality of bleed ports.
4. The engine of claim 1 wherein:
 - the joined one of the shroud rings is immediately upstream of the bleed one of the shroud rings.
5. The engine of claim 1 wherein:

the valve element is so shiftable via a combined circumferential rotation and longitudinal translation.

6. The engine of claim 1 wherein:
the valve element carries an outboard aft seal and an inboard fore seal for sealing with the structural case in the first condition.
7. The engine of claim 1 wherein:
a bleed flowpath through the bleed ports and the valve ports further extends through the structural hub to join a fan bypass flow.
8. The engine of claim 7 wherein:
the structural hub contains at least one fan exit guide vane; and
the bleed flowpath joins a fan bypass flow downstream of said fan exit guide vane.
9. A gas turbine engine comprising:
a fan;
a compressor along a core flow path and having:
 a plurality of rows of blades;
 a plurality of rows of vanes; and
 a plurality of shroud rings, at least a bleed one of which has a plurality of bleed ports;
a structural hub downstream of the shroud rings and secured relative to the shroud rings;
a structural case extending from an aft joint with the structural hub to a fore joint with a joined one of the shroud rings and having a plurality of valve ports, at least a portion of the structural case extending as a continuous piece between the fore and aft joints
a valve element shiftable between:
 a first condition in which the valve element blocks communication through the valve ports; and
 a second condition in which the valve element does not block said communication.
10. The engine of claim 9 wherein:

the joined one of the shroud rings is immediately upstream of the bleed one of the shroud rings.

11. The engine of claim 9 wherein:

the structural hub carries a plurality of fan exit guide vanes.

12. A method for assembling a gas turbine engine, the engine comprising:

a fan;

a compressor along a core flow path and having:

a plurality of rows of blades;

a plurality of rows of vanes; and

a plurality of shroud rings, at least a bleed one of which has a plurality of bleed ports;

a structural hub downstream of the shroud rings and secured relative to the shroud rings;

a structural case extending from an aft joint with the structural hub to a fore joint with a joined one of the shroud rings and having a plurality of valve ports;

a valve element shiftable between:

a first condition in which the valve element blocks communication through the valve ports; and

a second condition in which the valve element does not block said communication,

the method comprising:

assembling an exit guide vane assembly including an aftmost of said plurality of shroud rings to said structural hub;

assembling the structural case to the structural hub;

assembling an assembly of said shroud rings to the structural case with at least one of the shroud rings being at least partially inserted within the structural case.

13. The method of claim 12 wherein:

at least one fan exit guide vane is preassembled with the structural hub.

14. The method of claim 12 wherein:

the aftmost of said plurality of shroud rings has a plurality of duct portions associated with aft portions of said plurality of bleed ports; and

the at least one of the shroud rings includes a penultimate shroud ring having a plurality of duct portions associated with fore portions of said plurality of bleed ports.

15. The method of claim 12 further comprising:

assembling the valve element to the structural case after said assembling the structural case to the structural hub.